# Light Brown Apple Moth in California – 2008

California Department of Food and Agriculture United States Department of Agriculture

January, 2008



## Background and Problem Statement

- Light brown apple moth was first found and confirmed in California in March 2007.
- It is currently found in nine California counties.
- A statewide survey conducted in 2005 detected no light brown apple moths.
- If allowed to become permanently established, this invasive pest represents a significant risk to the environment & economy as it feeds on a wide variety of native and ornamental plants and trees.
- It probably arrived in California on live plant material from Australia or New Zealand.



#### **Host List**

Over 2,000 plant species are hosts including:

#### Native Species

cypress, oak, willow, Monterey pine, redwood, lupines

#### Horticultural Plants

roses, shrubs, flowers, landscape plantings

#### Crops

 peaches, plums, nectarines, apples, pears, citrus, peaches, avocadoes, grapes, cherries, walnuts, vegetables

## Larva Feeding on Apple





Hand lens view: Mature LBAM caterpillars eat flowers and young bunches of grapes. (Photo credit: DeAnn Glenn)



Summer-generation LBAM caterpillar feeding on maturing grape bunch. (Photo credit: Greg Baker)

### If Nothing is Done?

- Populations of threatened and endangered plant species could be severely impacted should this moth adapt to feeding on them.
- Increased pesticide use will occur in order to reduce the impact of LBAM in urban landscapes and agricultural commodities.
- The moth will eventually spread to other areas of California, other parts of the US and beyond.
- All of California will be in perpetual quarantine.
- The impact of a 1 to 5% crop loss on crop production costs for LBAM is estimated at \$160 - \$640 million annually just in the currently infested counties.

## Why is This Project an Emergency?

- Recent introduction in North America, with potential national & international consequences.
- Populations are still small and susceptible to eradication; a goal of eradication continues to be the recommendation of the technical working group.
- Extensive host list.
- Multiple generations per year.
- Potential for uncontrolled spread and environmental & economic impacts.

### **Actions Taken 2007**

- Implemented statewide trapping program.
- Delimited and quarantined infested areas.
- Convened technical working group.
- Mating disruption technique began Fall 2007
  - Two aerial applications of pheromone 30 days apart Seaside/Monterey.
  - One aerial application North County & Santa Cruz
- Eradicated several outlier infestations.

#### **Goals for Eradication**

- Base decisions on sound science and the best available technology.
- Design programs to minimize the environmental and public health impacts.
- Provide accurate public information.
- Effectively use integrated methods.

### **Eradication Strategy**

Eradication strategy is a multi-pronged approach with three main components for 2008:

- Aerial applications of pheromone for mating disruption (may also include ground-based male moth attractant treatment and/or larval pesticide treatments targeting the heaviest populations) beginning on the Monterey coast and moving to the San Francisco Bay Area.
- Male moth attractant treatments of smaller and isolated infestations.
- Mating disruption using twist ties for outlier infestations.

### 2008 Project Components

- Ground treatments (alone or in combination)
  - Twist-tie applications
  - Male moth attractant treatment
  - Stingless parasitic Wasps
  - Treatments for larvae
- Aerial applications for mating disruption
- Environmental Monitoring

### **Ground Treatment: Twist ties**

#### Twist ties will be used in:

- isolated sites;
- areas that are beyond 1.5 miles from a generally infested area;
- areas with a low level of LBAM detected.

## Ground Treatment: Male Moth Attractant Treatment

#### Consists of:

- LBAM pheromone to attract male moths to the site,
- with an insecticide Permethrin, to kill the males, and
- a clay-based matrix to hold the mix together

#### Will be used in:

- environmentally sensitive areas, buffer zones, etc;
- square miles with high populations of LBAM as a pretreatment before aerial applications
- areas with intermediate LBAM populations spread over several contiguous square miles.

## Ground Application: Releases of Parasitic Wasps

- Tiny (1/25<sup>th</sup> of an inch) stingless *Trichogramma* species wasps that attack and feed within moth eggs
- Parasites will be used initially in limited areas of:
  - Santa Cruz County;
  - San Francisco County (Golden Gate Park);
  - Monterey County (Carmel, Seaside/Marina).
- Estimated number to be released is 1,000,000 per square mile

## Ground Application: Releases of Parasitic Wasps

- The wasps are native to California and can be purchased for use by homeowners and growers.
- The wasps will not be released near threatened or endangered plants or insects.
- The wasps will not hurt the overwintering monarchs, people or pets.

## Ground Application: Treatment for Larvae

- May be used to treat areas where heavy larval populations are detected:
  - Spinosad (a naturally-occurring compound) or
  - Bacillus thuringiensis kurstaki, a naturallyoccurring bacteria.
- Both products are organically registered.

## Aerial Application: Mating Disruption Pheromone

New formulations of the mating disruption pheromone are now available. These formulations are being tested to determine which formulation(s) will be the most efficacious for the LBAM eradication program.

## Aerial Treatment of Mating Disruption Pheromone

- Aerial applications of mating disruption will be used to treat heavy populations.
- 30 to 90 day spray intervals are expected depending on efficacy testing results.
- Treatments expected to occur in Monterey,
   Santa Cruz, San Francisco, San Mateo,
   Alameda, Contra Costa and Marin counties.

### **Expanded Outreach Efforts**

- Meetings with editorial boards
- Expanded meeting schedule prior to treatment
  - Public meetings
  - Briefings for local officials
  - Presentations for community groups
- Frequent internal meetings on outreach plans
- Engaged a public relations firm to extend our outreach

### **Expanded Outreach Efforts**

Office of Environmental Health Hazard Assessment and Department of Public Health will work together to develop procedures to monitor the health of citizens in the treatment areas and to educate health care professionals about the program, any health effects of the tools and how to report any suspected cases of pesticide poisoning they might see.

### Information Available

- CDFA and USDA have information available to the public via the following web sites:
  - www.cdfa.ca.gov
  - <u>www.aphis.usda.gov</u>
- Sites are refreshed as new information is available and as new maps and quarantine areas are updated.
- New e-mail address for contacting CDFA:
  <u>lbam@cdfa.ca.gov</u>

